

**Amendment and Response**

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For: FERTILITY IMPAIRING VACCINE CONTAINING AVIAN ZONA PELLUCIDA PROTEIN AND  
METHOD OF USE

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**Amendments to the Claims** This listing of claims replaces all prior versions, and listings, of claims in the above-identified application:

1. (cancel)
2. (currently amended) The fertility impairing vaccine of claim ~~[[1]]~~ 29 wherein the avian zona pellucida protein is a glycoprotein.
3. (currently amended) The fertility impairing vaccine of claim ~~[[1]]~~ 29 wherein the avian zona pellucida protein is a naturally occurring protein.
4. (currently amended) The fertility impairing vaccine of claim ~~[[1]]~~ 29 wherein the avian zona pellucida protein is a recombinant protein.
5. (currently amended) The fertility impairing vaccine of claim ~~[[1]]~~ 29 wherein the avian zona pellucida protein is a chemically or enzymatically synthesized protein.
6. (cancel)
7. (currently amended) The fertility impairing vaccine of claim ~~[[6]]~~ 29 wherein the immunological adjuvant comprises synthetic trehalose dicorynomycolate.
8. (currently amended) The fertility impairing vaccine of claim ~~[[1]]~~ 29 ~~further comprising~~  
wherein the immunological adjuvant comprises squalene oil.

9. (currently amended) ~~[[The]]~~ A fertility impairing vaccine ~~of claim 1 wherein the polypeptide further comprises~~ comprising an avian zona pellucida protein or an immunogenic fragment thereof and further comprising at least one immune cell epitope ~~selected from the group consisting of a T cell epitope, a helper T cell epitope and a B cell epitope~~ from a virus, bacterium or parasite.

10. (currently amended) The fertility impairing vaccine of claim ~~[[1]]~~ 29 which is an immunosterilant vaccine.

11. (currently amended) The fertility impairing vaccine of claim ~~[[1]]~~ 29 which is an immunocontraceptive vaccine.

12-16. (cancel)

17. (currently amended) A method for impairing the fertility of an animal comprising administering to the animal a fertility impairing vaccine of claim ~~[[1]]~~ 29 wherein the vaccine is administered in a manner and an amount effective to cause fertility impairment in the animal.

18. (withdrawn) The method of claim 17 wherein the vaccine causes temporary, reversible infertility in the animal.

19. (withdrawn) The method of claim 17 wherein the vaccine causes permanent, irreversible infertility in the animal.

20. (withdrawn) The method of claim 17 wherein the animal is a mammal.

21. (withdrawn) The method of claim 20 wherein the mammal is selected from the group consisting a horse, a deer, an elephant, a rat, a mouse, a rabbit, a ferret, a dog and a cat.
22. (withdrawn) The method of claim 21 wherein the animal is a dog.
23. (withdrawn) The method of claim 21 wherein the animal is a cat.
24. (withdrawn) The method of claim 17 wherein the animal is a bird.
25. (currently amended) The method of claim ~~[[24]]~~ 17 wherein the fertility impairing vaccine further comprises ~~at least one component selected from the group consisting of (a) a polypeptide comprising a porcine zona pellucida protein or an immunogenic fragment thereof and (b) a polynucleotide comprising a nucleotide sequence encoding a polypeptide comprising a porcine zona pellucida protein or an immunogenic fragment thereof.~~
26. (currently amended) The method of claim 25 wherein the ~~fertility impairing vaccine is a polypeptide vaccine, and wherein the ratio (aZP:pZP) of avian zona pellucida protein (aZP) to porcine zona pellucida protein (pZP) is about 100:1 to about 1:100.~~
27. (currently amended) ~~[[The]]~~ A fertility impairing vaccine ~~of claim 16 further comprising at least one component selected from the group consisting of (a) a polypeptide comprising an avian zona pellucida protein or an immunogenic fragment thereof and a porcine zona pellucida protein or an immunogenic fragment thereof and (b) a polynucleotide comprising a nucleotide sequence encoding a polypeptide comprising a porcine zona pellucida protein or an immunogenic fragment thereof.~~

28. (currently amended) The fertility impairing vaccine of claim 27 ~~which is a polypeptide vaccine~~ wherein the ratio (aZP:pZP) of avian zona pellucida protein (aZP) to porcine zona pellucida protein (pZP) is about 100:1 to about 1:100.

29. (New) A fertility impairing vaccine comprising an avian zona pellucida protein or an immunogenic fragment thereof and an immunological adjuvant selected from the group consisting of aluminum hydroxide, Acemannan, permulum, synthetic trehalose dicorynomycolate, squalene oil, drakeol, vegetable oil, lecithin, phosphatidyl choline, and combinations thereof.

30. (New) A fertility impairing vaccine comprising an avian zona pellucida protein or an immunogenic fragment thereof wherein the avian zona pellucida protein or an immunogenic fragment thereof is conjugated to an immunogenic carrier protein.

31. (New) A fertility impairing vaccine comprising an avian zona pellucida protein or an immunogenic fragment thereof and delivery vehicle.

32. (New) The fertility impairing vaccine of claim 31 wherein the delivery vehicle is selected from the group consisting a microsphere-mediated delivery vehicle, liposome-mediated delivery vehicle, a microencapsulation delivery vehicle, a time-release delivery vehicle, and combinations thereof.

33. (New) A fertility impairing vaccine comprising an avian zona pellucida protein or an immunogenic fragment thereof packaged for delivery through a dart or a bullet.

34. (New) A fertility impairing vaccine comprising a 70 kD avian zona pellucida protein or

an immunogenic fragment thereof.

35. (New) A fertility impairing vaccine comprising a 40 kD avian zona pellucida protein or an immunogenic fragment thereof.

36. (New) A fertility impairing vaccine comprising a 35 kD avian zona pellucida protein or an immunogenic fragment thereof.

37. (New) A fertility impairing vaccine comprising two, but not three, of the following: a 40 kD avian zona pellucida protein or an immunogenic fragment thereof; a 35 kD avian zona pellucida protein or an immunogenic fragment thereof; and a 70 kD avian zona pellucida protein or an immunogenic fragment thereof.

38. (New) A fertility impairing vaccine, wherein the vaccine comprises a 40 kD avian zona pellucida protein or an immunogenic fragment thereof, and a 35 kD avian zona pellucida protein or an immunogenic fragment thereof, and does not comprise a 70 kD avian zona pellucida protein or an immunogenic fragment thereof.

39. (New) The fertility impairing vaccine of claim 9 wherein the immune cell epitope is a T cell epitope, a helper T cell epitope, or a B cell epitope from a parasite.